

## I. Amendments

The specification at page 15 lines 10-11 and page 17 line 6 was amended to correct the phrase "where Q, Y, L<sub>1</sub>, L<sub>2</sub>, and L<sub>3</sub> are selected from structures I, II, and III" to read: "where Q is selected from structures I and II above, and Y, L<sub>1</sub>, L<sub>2</sub>, and L<sub>3</sub> are as described for compound III above." The revised text is clearly what was intended by the original, typographically erroneous text.

With reference to claim 1, support for the language "*or L<sub>1</sub> is —NRC(=O)(CH<sub>2</sub>)<sub>n</sub>—, —NRC(=O)(CH<sub>2</sub>)<sub>n</sub>C(=O)NH—, or —NR(CH<sub>2</sub>)<sub>n</sub>C(=O)NH(CH<sub>2</sub>)<sub>n</sub>, L<sub>2</sub> is —(CH<sub>2</sub>)<sub>n</sub>O—, and L<sub>3</sub> is —(CH<sub>2</sub>)<sub>n</sub>—, where each n is an integer from 1 to 12*" can be found in original claim 8 and the specification at page 15 lines 1-3, for example. Support for including "*OP(NR<sub>1</sub>R<sub>2</sub>)(OR<sub>3</sub>)*" as a possible Z group, "*where R<sub>1</sub> and R<sub>2</sub> are C<sub>1</sub>–C<sub>12</sub> alkyl; C<sub>5</sub>–C<sub>14</sub> aryl; or cycloalkyl containing up to 10 carbon atoms, or when R<sub>1</sub> and R<sub>2</sub> are taken together with the phosphoramidite nitrogen atom, R<sub>1</sub> and R<sub>2</sub> are C<sub>4</sub>–C<sub>11</sub> alkylidyl, and R<sub>3</sub> is a phosphite ester protecting group*" can be found in the specification at page 17 lines 3-14, for example. No new matter has been added by any of the amendments.

## II. Election of Species

Applicant's response submitted May 10, 2002 (filed in the PTO on 5/11/02) was considered to be non-responsive on the grounds that elected species, compound 88, allegedly comprised "a Q moiety which is not disclosed in the elected group." The Examiner requested that the applicant "specifically elect a Q and a[n] X moiety." However, in a telephone conference on August 29, 2002 between the Examiner and Alex Andrus (applicant's prior representative), the Examiner agreed that the elected species was in retrospect adequate.

In particular, the Examiner agreed that the Q moiety in compound 88 is encompassed by claim 1 via the upper Q structures recited in claim 1 and by the language "wherein ... one of the aryl carbons of the diazo structures is the site of attachment to L<sub>1</sub>; at least one aryl carbon of each diazo structure is substituted with an electron-withdrawing group and at least one aryl carbon of each diazo structure is substituted with an electron-donating group".

Furthermore, the X moiety in compound 88 is encompassed by claim 1 by the language "or X is an acid-labile protecting group," such as DMT (dimethoxytrityl) (see claim 9 and the specification at page 14 line 20, for example).

Accordingly, claims 1-25 are ready for examination.

**PETITION FOR TIME EXTENSION and FEE AUTHORIZATION**

A Petition for 2-Month Extension of Time is enclosed herewith. If any additional time extensions are required, such time extensions are hereby requested. If any additional fees not submitted with this response are required, please take such fees from Applied Biosystems Deposit Account No. 01-2213 (Order No. 4584US).

Respectfully submitted,

Date: \_\_\_\_\_

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**Appendix Showing Markup of Changes**

*Added text is indicated by bold and underlining, deletions by brackets*

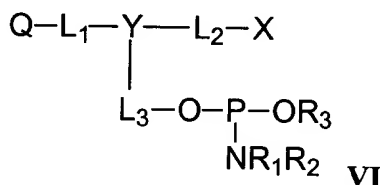
**In the Specification**

Change the text at page 15 lines 10-11 to read as follows:

where Q is selected from structures I and II above, and Y, L<sub>1</sub>, L<sub>2</sub>, and L<sub>3</sub> are as described for compound III above [selected from structures I, II, and III]. A may be any cleavable linker, including the structures:

Change the text at page 17 lines 3-18 to read as follows:

Fluorescence quencher compositions of the invention include quencher-phosphoramidites according to the structure VI:

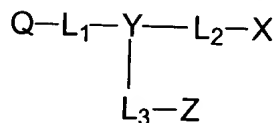


where Q is selected from structures I and II above, and Y, L<sub>1</sub>, L<sub>2</sub>, and L<sub>3</sub> are as described for compound III above [selected from structures I, II, and III]. Quencher-phosphoramidite reagents VI are particularly useful for the automated synthesis of labelled polynucleotides. The phosphoramidite reagents can be nucleosidic (X = nucleoside) or non-nucleosidic, according to structure VI, which can effect labelling of a polynucleotide or polypeptide with one or more protected or unprotected quencher moieties, Q. When taken separately, R<sub>1</sub> and R<sub>2</sub> are C<sub>1</sub>-C<sub>12</sub> alkyl such as methyl, ethyl, or isopropyl; C<sub>5</sub>-C<sub>14</sub> aryl; or cycloalkyl containing up to 10 carbon atoms such as, morpholino. When taken together with the phosphoramidite nitrogen atom, R<sub>1</sub> and R<sub>2</sub> may be C<sub>4</sub>-C<sub>11</sub> cycloalkyl, e.g. morpholino. R<sub>3</sub> is a phosphite ester protecting group which prevents unwanted extension of the polynucleotide. Generally, R<sub>3</sub> is stable to polynucleotide or polypeptide synthesis conditions yet is able to be removed from a synthetic polynucleotide product with a reagent that does not adversely affect the integrity of the polynucleotide or the dye. R<sub>3</sub> may be C<sub>1</sub>-C<sub>6</sub> alkyl, such as methyl, tert-butyl, or cyanoethyl; C<sub>5</sub>-C<sub>14</sub> aryl, such as phenyl or 2-(4-nitrophenyl)ethyl.

**In the Claims**

**Amend claim 1 to read as follows:**

1. (Amended) A fluorescence quencher composition having the structure:



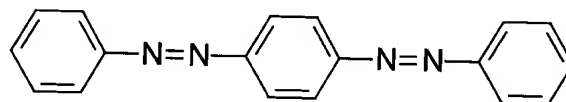
wherein Y is selected from N and CR, where R is H, C<sub>1</sub>-C<sub>6</sub> alkyl or C<sub>5</sub>-C<sub>14</sub> aryl;

L<sub>1</sub>, L<sub>2</sub>, and L<sub>3</sub> are independently selected from a bond, C<sub>1</sub>-C<sub>12</sub> alkylidyl, C<sub>1</sub>-C<sub>12</sub> alkoxyldyl, C<sub>1</sub>-C<sub>12</sub> alkylaminodiy, C<sub>1</sub>-C<sub>12</sub> alkylamidediy, C<sub>5</sub>-C<sub>14</sub> arylidyl, and 1-20 ethyleneoxy units; or L<sub>1</sub> is —NRC(=O)(CH<sub>2</sub>)<sub>n</sub>—, —NRC(=O)(CH<sub>2</sub>)<sub>n</sub>C(=O)NH—, or —NR(CH<sub>2</sub>)<sub>n</sub>C(=O)NH(CH<sub>2</sub>)<sub>n</sub>, L<sub>2</sub> is —(CH<sub>2</sub>)<sub>n</sub>O—, and L<sub>3</sub> is —(CH<sub>2</sub>)<sub>n</sub>—, where each n is an integer from 1 to 12;

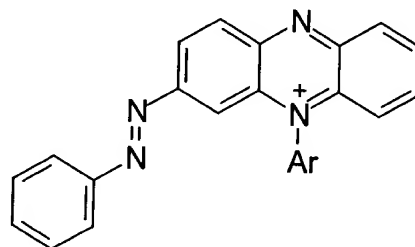
X is an amino acid, a polypeptide, a nucleoside, a nucleotide, a polynucleotide, or a protected form thereof; or X is an acid-labile protecting group;

Z is selected from H, CO<sub>2</sub>H, OH, NH<sub>2</sub>, NHR, NR<sub>2</sub>, SH, OP(NR<sub>1</sub>R<sub>2</sub>)(OR<sub>3</sub>), an ester, a cleavable linker, a solid support, a reactive linking group, and a label selected from a fluorescent dye, a hybridization-stabilizing moiety, a chemiluminescent-dye, and an affinity ligand, where R<sub>1</sub> and R<sub>2</sub> are C<sub>1</sub>-C<sub>12</sub> alkyl; C<sub>5</sub>-C<sub>14</sub> aryl; or cycloalkyl containing up to 10 carbon atoms, or when R<sub>1</sub> and R<sub>2</sub> are taken together with the phosphoramidite nitrogen atom, R<sub>1</sub> and R<sub>2</sub> are C<sub>4</sub>-C<sub>11</sub> alkylidyl, and R<sub>3</sub> is a phosphite ester protecting group; and

Q is selected from the diazo structures:



and



wherein Ar is C<sub>5</sub>-C<sub>14</sub> aryl; one of the aryl carbons of the diazo structures is the site of attachment to L<sub>1</sub>; at least one aryl carbon of each diazo structure is substituted with an electron-withdrawing group and at least one aryl carbon of each diazo structure is substituted with an electron-donating group.